APPENDIX A

DATA DICTIONARY

The data dictionary will explain the design and function of each file and its underlying fields / attributes. It will divide the data into two components: input files and output files. Further, all files are ARC/INFO coverage files, Dbase 4 files, or ASCII text files. Chapter 4 provides a functional overview of all the input and output files. ARC/INFO coverages consist of several related files that are maintained by the software. For these databases, only the attribute file is described because it is usually the only one edited by the user. Fields in the attribute files maintained by ARC/INFO (area, perimeter, length, cover#, and cover-id) are not profiled.

The directory structure consists of 16 directories. All directory contents are discussed in detail later:

1. *aml* – Contains 'aml' scripts. These ASCII files are ARC/INFO macros that are called throughout the process.

2. *Code* – Contains 'C' programming code. The ASCII code files, and their binary object and executable files are stored in this directory.

3. *Em* – Contains emission estimate results. All final emission estimates are written to this directory.

4. *Grade* – Contains all files required to estimate the road grade for the study area.

5. *Grid* – Contains all vector grid coverages that are desired for the assessment (e.g., 1 km, 2km, 4km).

6. *Landmarks* – Contains all point data for specific landmarks (schools, universities, etc.)

7. *Lookup* – Contains all ASCII look-up files. These consist of the SCF emission rate file and Vehicle Test Weight file.

8. *Modalmats* – All the pre-processed modal matrices required for the aggregate-modal emission rates are stored here.

9. *Raster* – All the gridded, hourly, raster outputs are located here.

10. *Raw* – Contains readable copies of all the input files.

11. *Road* – Contains all data related to the road network.

12. *Sa* – Contains all the ASCII speed / acceleration matrices used to calculate average speed and modal conditions.

13. *Temp* – Initially contains nothing. But during processing, it is a working directory where temporary files are written and erased.

14. *Templates* – Contains empty data templates that speed up the writing of files with many fields. These are all INFO files.

15. *Tg* – Contains all vehicle-related information needed to determine emission-specific technology group distributions.

16. *Zone* – Contains all zonal based data (landuse, census data, TAZs, etc.).

INPUT Files:

ARC/INFO Coverages:

1. **GRID** – GRID is a vector polygon coverage that will be used as the basis for the output raster database. This database should consist of regular square sized polygons of any user-defined dimension. All attribute data are found in the polygon attribute table call 'grid.pat'. One way to get this database for the study area is to use the ARC/INFO command 'generate' with the 'fishnet' option. This database is stored in the 'grid' directory.

```
COLUMN   ITEM NAME          WIDTH OUTPUT  TYPE N.DEC
     1   AREA                  4    12      F     3
     5   PERIMETER             4    12      F     3
     9   GRID#                 4     5      B     -
    13   GRID-ID               4     5      B     -
    17   GDID                  4     5      B     -
```

The field GDID represents a unique ID field that is initially set to the internal id GRID# + 1. One is added because the first record is an external polygon representing undefined space. This undefined space is therefore assigned a 0 id. The GDID is used to track disaggregation that occurs during processing.

2. **LANDUSE** – The LANDUSE coverage is a vector polygon database consisting of residential, commercial, and other landuses. It is used to disaggregate TAZ trip information into smaller areas. For example, it is assumed that vehicle trips that begin at home and end up at work, begin in residential and end in non-residential land uses. This disaggregation allows the engine start emissions to be better spatially defined.

```
COLUMN    ITEM NAME      WIDTH OUTPUT  TYPE N.DEC
     1   AREA              4    12     F     3
     5   PERIMETER         4    12     F     3
     9   LANDUSE#          4     5     B     -
    13   LANDUSE-ID        4     5     B     -
    17   LU                3     3     C     -
```

The LU field consists of three characters describing the land use type. Acceptable values for this first version are 'RES', 'COM', or 'UNK'. 'UNK' polygons have landuses that are unknown or non-residential or non-commercial. For example, an institutional land use would be designated 'UNK'.

3. **CENSUS** – The CENSUS dataset is a vector polygon coverage of socioeconomic data. It is expected that these polygons would be Census Blocks defined in the 1990 US Census and stored in the 1994 TIGER files. Actually, they can represent other datasets (parcel level data, local economic zones, etc.). It is important that the fields be present as described below.

```
COLUMN    ITEM NAME      WIDTH OUTPUT  TYPE N.DEC
     1   AREA              4    12     F     3
     5   PERIMETER         4    12     F     3
     9   CENSUS#           4     5     B     -
    13   CENSUS-ID         4     5     B     -
    17   CBID              4     5     B     -
    21   HU90              8     8     I     -
    25   HU90/KM           8    16     F     5
    33   SOV               8    10     F     4
    41   CARPOOL           8    10     F     4
```

The CBID field is the identifier that is tracked throughout the modeling process. This field becomes a key field to link zonal activity and emission estimates. The HU90 field contains the number of housing units (1990) found within the polygon. This field is used to disaggregate home-based trips from the TAZ level to the Census Block level. The HU90/KM is the 1990 housing units per square kilometer. The SOV field is the fraction of 1990 workers that drove to work alone. The CARPOOL field is the fraction of 1990 workers that carpooled to work. The remaining trips were non-auto trips.

4. **TAZ** – The TAZ dataset is a vector polygon coverage of the local planning organization's traffic analysis zones. The zones are used in planning agencies as a spatial unit, summarizing trip origins and destinations that occur within each. The

trip estimates are used to predict the number of engine starts that occur within the zone.

```
COLUMN    ITEM NAME        WIDTH OUTPUT   TYPE N.DEC
     1    AREA                 4     12      F     3
     5    PERIMETER            4     12      F     3
     9    TAZ#                 4      5      B     -
    13    TAZ-ID               4      5      B     -
    17    TZID                 4      5      B     -
    21    HBW_PRD              8     10      f     0
    29    HBSH_PRD             8     10      f     0
    37    HBGS_PRD             8     10      f     0
    45    HBU_PRD              8     10      f     0
    53    HBO_PRD              8     10      f     0
    61    NHB_PRD              8     10      f     0
    69    HBW_ATT              8     10      f     0
    77    HBSH_ATT             8     10      f     0
    85    HBGS_ATT             8     10      f     0
    93    HBU_ATT              8     10      f     0
   101    HBO_ATT              8     10      f     0
   110    NHB_ATT              8     10      f     0
```

The TZID field represents the TAZ identifier that is tracked throughout the modeling procedures. It is a key field that is used often to link related data and subsequent estimates. The remaining fields identify trip types that are defined by the local travel demand forecasting models developed and used by local transportation planners. HBW_PRD are 24-hour home-based work productions (trips between home and work or work and home). HBSH_PRD are home-based shopping trip productions. HBGS_PRD are home-based grade-school productions. HBU_PRD are home-based university trip productions. HBO_PRD are home-based other productions (trips that begin or end at home and go to or return from someplace other than work, shopping areas, grade schools, or universities). NHB_PRD are trips that begin and end someplace besides home. All the remaining fields ending in ATT describe the attractions of each trip type.

5. **ZIP code** – The ZIPCODE dataset is a vector polygon database that represents 5 digit ZIP codes in the study area. The primary purpose of the ZIP code database is to identify vehicle type distribution locations for those vehicles whose address was unmatched. During the assessment of vehicle registration data (discussed later), individual vehicles are assigned coordinates based on their address. When the address location can not be successfully or confidently identified, the vehicle's location parameter becomes its registered ZIP code. This polygon database becomes the means of identifying location. It also provides another polygonal form for aggregating results for comparison between ZIP codes in a region.

```
COLUMN    ITEM NAME        WIDTH OUTPUT   TYPE N.DEC
     1    AREA                 4     12      F     3
     5    PERIMETER            4     12      F     3
```

```
    9   ZIPCODE#                  4     5      B      -
   13   ZIPCODE-ID                4     5      B      -
   17   ZIPCODE                   5     5      I      -
   22   ZPID                      4     5      B      -
```

The ZIPCODE field holds the 5-digit ZIP code number. The ZPID field is an ID that is tracked throughout the model.

6. **Allroads** – The ALLROADS dataset is a vector line database of all roads in the study area. The lines are used to identify the locations of emissions that occur as a vehicle moves through the road network. Emission estimates are estimated on a line-by-line basis. The fields are;

```
COLUMN    ITEM NAME         WIDTH OUTPUT   TYPE N.DEC
    1   FNODE#                    4     5      B      -
    5   TNODE#                    4     5      B      -
    9   LPOLY#                    4     5      B      -
   13   RPOLY#                    4     5      B      -
   17   LENGTH                    8    18      F      5
   25   ALLROADS#                 4     5      B      -
   29   ALLROADS-ID               4     5      B      -
   33   ARID                      8     8      I      -
   41   TFID                      4     5      B      -
```

The ARID field is a unique identifier for every line. This identifier is tracked throughout the modeling process and used a key field linking a number of related files. The TFID field is an identifier linking the travel demand forecasting network link. Every line in the local planning organization's network must be represented in the ALLROADS road dataset. TFID becomes a key field for linking travel demand forecasting model data and emission outputs.

7. **Landmarks** – The LANDMARKS dataset is a vector point database of schools and universities. These landmarks are special trip generators and attractors used in developing estimates travel behavior by local planners. Only grade school and university locations are used in this version.

```
COLUMN    ITEM NAME         WIDTH OUTPUT   TYPE N.DEC
    1   AREA                      4    12      F      3
    5   PERIMETER                 4    12      F      3
    9   LANDMARKS#                4     5      B      -
   13   LANDMARKS-ID              4     5      B      -
   17   CODE                      4     4      C      -
```

 The CODE field identifies whether the landmark is a grade school or a university. A code of 'G09' indicates a grade school. A code of 'D43' represents a university. The codes correspond to database definitions used by a landmark database available in many cities.

INFO Files:

1. **TDFN.DAT** – The TDFN.DAT datafile contains fields that are used in the travel demand forecasting software called TRANPLAN. This file holds the predicted road volumes, average speeds, and capacities that are output from the software. These items area used in MEASURE to identify the number of vehicles and levels of congestion for each modeled road segment.

```
COLUMN    ITEM NAME        WIDTH OUTPUT   TYPE N.DEC
      1   TFID                 4     5      B     -
      5   FN                   6     6      I     -
     11   TN                   6     6      I     -
     17   ASSIGN_GR            1     1      I     -
     18   DIST                 4     4      I     -
     22   AB_OPTION            3     3      C     -
     25   ABSPEED1             4     4      I     -
     29   ABSPEED2             4     4      I     -
     33   ABDIR                2     2      I     -
     35   ABLG1                2     2      I     -
     37   ABLG2                2     2      I     -
     39   ABLG3                2     2      I     -
     41   ABCAP                6     6      I     -
     47   ABVOL                6     6      I     -
     53   BA_OPTION            3     3      C     -
     56   BASPEED1             4     4      I     -
     60   BASPEED2             4     4      I     -
     64   BADIR                2     2      I     -
     66   BALG1                2     2      I     -
     68   BALG2                2     2      I     -
     70   BALG3                2     2      I     -
     72   BACAP                6     6      I     -
     78   BAVOL                6     6      I     -
```

Only seven fields in this file are used by the model: TFID, ABSPEED1, ABCAP, ABVOL, BASPEED1, BACAP, and BAVOL. Fields with AB refer to the travel lanes moving in the 'from node' – 'to node' direction while BA refers to the reverse direction. The TFID field is a key field that is used to link to the ALLROADS attribute table. ABSPEED1 and BASPEED1 are the average modeled speeds in hundredths of a mile per hour. ABCAP and BACAP are the estimated capacities of the road by direction. ABVOL and BAVOL are the estimated 24-hour volumes of the road by direction. The remaining fields are not used by the model, but are maintained for future query capability. FN and TN are from and to node identifiers. ASSIGN_GR is the road classification. DIST is the actual distance of the TRANPLAN link. AB_OPTION and BA_OPTION are flags indicated road characteristics. ABSPEED2 and BASPEED2 are usually not used, but can represent average speed for a different set of conditions. ABDIR and BADIR

identify the direction of each lane group. ABLG1-3 and BALG1-3 are fields that can identify factors for specific lanes or lane groups.

2. **TEMPORAL.FACTORS** – The TEMPORAL.FACTORS (in the 'templates' directory) database contains multipliers for hourly travel activity. The file contains one record for each hour of a day, and fields for each trip purpose and one for on-road activity. For example, record 8 (representing 7-8 am) holds a value of 0.18080, meaning that 18.08% of daily on-road travel occurs during this period. These data were developed for Atlanta based on regional reports on travel behavior.

ASCII Files:

1. **SCF.CSV –** The SCF.CSV comma-delimited file is a lookup table for the running exhaust gram/second emission rates from MOBILE5a listed by 10-MPH increments and model year. It was created by running MOBILE5a for the given condition (100% fleet with certain model year, average speed of certain increment) with cold start percentages set to zero. Cold starts are calculated separately. There are five columns of data;
   - The first column is average speed in miles per hour.
   - The second column is the model year (1970-1994).
   - The third column is the CO emission rate.
   - The fourth is the HC emission rate.
   - The fifth is the NOx emission rate.

   This file replaces the need to run the MOBILE5a model repeatedly during MEASURE run time.

2. **ZONE.TWT and ZIP.TWT** – The ZONE.TWT and ZIP.TWT comma-delimited files identify vehicle characteristics by location. These files are the products of a series of programs that exist outside of MEASURE. The programs process department of motor vehicle registration data by address-geocoding and VIN decoding all of the records. During the address-geocoding process, individual vehicles are either successfully or unsuccessfully geocoded. Successful records are assigned a zone identifier that is the equivalent of CBID discussed previously and written to ZONE.TWT file. Unsuccessful records default to the ZIP code and are written to the ZIP.TWT file. The files are identical in structure; 10 columns of data:
   - The first column contains the zonal or ZIP code identifier.
   - The second column contains the vehicle identification number, or VIN.
   - The third column contains the model year.
   - The fourth column contains the emission control equipment type (4 = Oxidation and Catalyst, 3 = Catalyst only, 2 = Oxidation only, 1 = none).
   - The fifth column contains the fuel delivery type flag (4 = DS, 3 = Throttle Body, 2 = Carburetor, 1 = Anything else).
   - The sixth column contains the cubic inch displacement of the engine.
   - The seventh column contains the vehicle test weight in pounds.

- The eighth column contains a flag for being a CO high emitter or not.
- The ninth column contains a flag for being a HC high emitter or not.
- The tenth column contains a flag for being a NOx high emitter or not.

3. **SZZP.ASC** – The SZZP.ASC comma-delimited file holds factors for joining technology7 group fractions from the ZIP code level to the zonal level (census blocks). Area and address-matching rates are used to factor the ZIP code fractions by multiplying both distributions by their appropriate match or failure rate. The ZIP code distribution is further factored by the area of the zone divided by the area of the ZIP code. The distributions are then combined to give the best estimate of the zonal technology group distribution. The file has five columns of data;
   - The first column contains the zone identifier.
   - The second column contains the zone area in square feet.
   - The third column contains the ZIP code identifier.
   - The fourth column contains the ZIP code area in square feet.
   - The fifth column contains the address-geocoding success rate.

4. **GRADE.XY** – The GRADE.XY file is a comma-delimited file of points along roads that have grade data. The file is usually developed from the output of a dynamic attitude GPS device. The first column is the unique point identifier, the second column is the x coordinate (using whatever projection system is standard to the rest of the data) and the third column is the y coordinate. These locations are matched with other data and assigned to road segments based on their location.

5. **GRADE.GR** – The GRADE.GR file accompanies the previous file by providing the road grade reading at that location. The first column of this comma-delimited file is the unique identifier, and the second is the road grade reading.

OUTPUT FILES

The output files consist of a number of intermediate and final Dbase 4 files, ARC/INFO coverages, and raster GRID databases. Many of the intermediate outputs are saved for comparison, making all data available for analysis. Many files are created and processed in during individual module runs. These files are temporarily stored until the particular module is complete. The temporary files are not discussed in this data dictionary, only the outputs from each module.

Zonal Environment Module:

1. **Sz** – The SZ (start zones) database is an ARC/INFO polygon coverage that is the spatial intersection of the input polygons CENSUS, TAZ, LANDUSE, and ZIPCODE. Every SZ polygon has identifiers to the original polygon structures. The SZ database is used as the spatial aggregation for estimating engine start emissions.

At the end of the model, each individual polygon has an estimate of the amount of CO, HC and NOx emissions that result from engine starts.

```
COLUMN    ITEM NAME        WIDTH OUTPUT   TYPE N.DEC
     1   AREA                 4     12      F     3
     5   PERIMETER            4     12      F     3
     9   SZ#                  4      5      B     -
    13   SZ-ID                4      5      B     -
    17   CBID                 4      5      B     -
    21   HU90/KM              8     16      F     5
    29   TZID                 4      5      B     -
    33   ZPID                 4      5      B     -
    37   SZID                 4      5      B     -
```

The CBID field identifies the CENSUS polygon. The TZID field identifies the TAZ polygon. The ZPID identifies the ZIP code polygon. The SZID field represents a unique identifier for each 'start zone'. The HU90/KM field is the 1990 Census households per square kilometer for that polygon.

2. **Sz.dat** – The SZ.DAT info file maintains important data for each 'start zone'. It is created by stripping attributes from the combined coverages that make up the 'start zones'.

```
COLUMN    ITEM NAME        WIDTH OUTPUT   TYPE N.DEC
     1   SZID                 4      5      B     -
     5   AREA                 4     12      F     3
     9   LU                   3      3      C     -
    12   HU90                 4      5      B     -
    16   HU90/KM              8     16      F     5
    24   SOV                  8     10      F     4
    32   CARPOOL              8     10      F     4
    40   HBW_PRD              8     10      F     0
    48   HBSH_PRD             8     10      f     0
    56   HBGS_PRD             8     10      f     0
    64   HBU_PRD              8     10      f     0
    72   HBO_PRD              8     10      f     0
    80   NHB_PRD              8     10      f     0
    88   HBW_ATT              8     10      f     0
    96   HBSH_ATT             8     10      f     0
   104   HBGS_ATT             8     10      f     0
   112   HBU_ATT              8     10      f     0
   120   HBO_ATT              8     10      f     0
   128   NHB_ATT              8     10      f     0
   136   ZIPCODE              5      5      I     -
   141   TZID                 4      5      B     -
   145   CBID                 4      5      B     -
   149   RES                  8     10      F     0
   157   NONRES               8     10      F     0
   165   COM                  8     10      F     0
```

The SZID field is the unique key field that links to the SZ polygons. AREA is the area of the SZ polygon in the current projection units. LU is the land use read from the LANDUSE polygons. HU90 is the estimated 1990 housing units for the SZ polygon. HU90/KM is the housing unit density in square kilometers. SOV and CARPOOL contain the fraction of travel to work by each type. The next 12 fields, starting with HBW_PRD, contain the estimates of the number of trips produced or attracted to the SZ polygon for each trip type. The ZIPCODE field holds the SZ polygons 5-digit ZIP code. TZID is the identifier to a TAZ polygon, and CBID is the identifier to the CENSUS polygon. RES contains the area of residential land use in square kilometers. NONRES contains the area of non-residential land use in square kilometers. COM contains the area of commercial land use in square kilometers.

Road Environment Module:

1. **Mr** – The MR database is a vector line dataset of major road centerlines in the study area. This database contains the entities that are used to aggregate emissions that occur from running exhaust on major roads. Major roads are defined as those modeled by the local planning organization's regional travel demand forecasting model. These roads are considered separately because of the prognostic data available through the forecast models. Individual lines represent road segments that start and end at crossings of other major roads.

```
COLUMN   ITEM NAME       WIDTH OUTPUT   TYPE N.DEC
     1   FNODE#              4     5      B    -
     5   TNODE#              4     5      B    -
     9   LPOLY#              4     5      B    -
    13   RPOLY#              4     5      B    -
    17   LENGTH              8    18      F    5
    25   MR#                 4     5      B    -
    29   MR-ID               4     5      B    -
    33   ARID                8     8      I    -
    41   TFID                4     5      B    -
```

   Outside normal system fields managed by ARC/INFO, each line has two identifier fields. The first is ARID. ARID is a key field link to the ALLROADS input database. The second, TFID is a key field link to the TDFN.DAT input file.

2. **Mz** – The MZ database is a polygon database of minor road aggregations. These polygons are bounded by lines from the MR database. The polygons are used to aggregate running exhaust emissions that occur of the major road network (those roads not modeled by regional travel demand forecasting models).

```
COLUMN   ITEM NAME       WIDTH OUTPUT   TYPE N.DEC
     1   AREA                8    18      F    5
     9   PERIMETER           8    18      F    5
    17   MZ#                 4     5      B    -
    21   MZ-ID               4     5      B    -
    25   MZID                4     5      B    -
```

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The field MZID is a unique identifier that is used as a key field linking activity and emissions data estimated by the model.

Engine Start Activity Module:

1. **Sz-act.dbf** – The SZ-ACT.DBF file is a Dbase 4 file of engine start activity occurring within the SZ (start zone) polygons. The file is created by spatially disaggregating regional travel information and temporal factors from the input files.

```
COLUMN    ITEM NAME        WIDTH OUTPUT   TYPE N.DEC
     1   SZID                 4     5      B     -
     5   ES1                  4     5      B     -
         |
         ES24                 4     5      B     -
```

The SZID field is an identifier to an SZ polygon. The ES1-ES24 fields contains the number of engine starts that occur within each ES polygon during that particular hour (ES1 = engine start from midnight to 1AM).

Running Exhaust Activity Module:

1. **Mr-act.dbf** – The MR-ACT.DBF file is a Dbase 4 file of running exhaust activity parameters that occur on each MR (major road) line.

```
COLUMN    ITEM NAME        WIDTH OUTPUT   TYPE N.DEC
     1   ARID                 8     9      F     0
     9   TFID                 8    11      F     0
    17   FREQUENCY            8    11      F     0
    25   SUM_SA1              8    25      F     6
    33   SUM_SA2              8    25      F     6
    41   SUM_SA3              8    25      F     6
    49   SUM_SA4              8    25      F     6
    57   SUM_SA5              8    25      F     6
    65   LENGTH               8    24      F     5
    73   CLASS                8     2      F     0
    81   CAPACITY             8     7      F     0
    89   LANES                8     3      F     0
    97   SPD1-24              8    16      F     5
   289   VOL1-24              8     7      F     0
   481   LOS1-24              1     1      C     -
   505   VCR1-24              8    12      F     1
```

The field ARID is a link to the ALLROADS database. The field TFID is a link to the TDFN.DAT file. FREQUENCY is the number of grade data points for each record (major road segment). SUM_SA1 is the number of data points with grades less than -0.045. SUM_SA2 is the number of data points with grades between -0.045 and -0.015. SUM_SA3 is the number of data points with grades between -0.015 and +0.015. SUM_SA4 is the number of data points with grades between +0.015 and +0.045. SUM_SA5 is the number of data points with grades greater

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than +0.045. LENGTH is the length of the road segment in the current map units (meters). CLASS is the road classification. LANES is the number of one-way travel lanes for the road segment. SPD1-24 is the average travel speed for each hour in a day. VOL1-24 is the traffic volume for each hour. LOS1-24 is the level of service for each hour. VCR1-24 is the volume to capacity ratio.

2. **Mz-act.dbf** – The MZ-ACT.DBF file is a Dbase 4 file of the minor zone vehicle activity. The file stores activity information that is used in predicting emissions. The MZID field is an identifier linking the data to the MZID polygons. The MEAN_TRAVE field is the aggregate mean travel time from the centroid of each SZ polygon to the closest major road. The fields SUM_ES1-24 contain the aggregate number of engine starts (trips) that occur within the minor zone during the given hour.

Engine Start Technology Group Module:

1. **Estg.dbf** – The ESTG.DBF file contains all the emission-specific technology group distributions for each CENSUS polygon (1990 Census Blocks). The CBID field links to the CBID field in the CENSUS and SZ polygons. The FREQ field shows the total number of active vehicles estimated to reside in the polygon. The remaining fields are the distributions. Every individual vehicle is assigned a technology group for CO, HC, and NOx. Within each pollutant, vehicles are divided into high and normal emitters based on technology characteristics. Therefore, the fields are as follows:

   ESCON: Engine Start, CO, Normal
   ESCOH: Engine Start, CO, High
   ESHCN: Engine Start, HC, Normal
   ESHCH: Engine Start, HC, High
   ESNON: Engine Start, NOx, Normal
   ESNOH: Engine Start, NOx, High

2. **Esreg.dbf** – The ESREG.DBF file contains all the engine start emission-specific technology group distributions for the regional fleet. The file only contains the group fields and a frequency field.

Running Exhaust Technology Group Module:

1. **Mrtg.dbf** – This file contains aggregate modal running exhaust technology group distributions for each road segment in the MR line database. The ARID field links to the MR.AAT and the ALLROADS.AAT attribute tables. The FREQ field shows the total number of vehicles operating on the line in a 24-hour period. The technology group fields are as follows:

   HSCON: Running Exhaust, CO, Normal

HSCOH: Running Exhaust, CO, High
HSHCN: Running Exhaust, HC, Normal
HSHCH: Running Exhaust, HC, High
HSNON: Running Exhaust, NOx, Normal
HSNOH: Running Exhaust, NOx, High

2. **Scftg.dbf** – The SCFTG.DBF file is a Dbase 4 file of the Speed Correction Factor Technology Groups. These are the model year distributions used by MOBILE5a to determine appropriate running exhaust emission rates. The file links to the MR and ALLROADS line databases through the ARID identifier field. The FREQ field identifies the number of vehicles predicted to operate on that road segment during a 24-hour period. The remaining fields MY70-MY94 show the fraction of the operating vehicles in each model year.

3. **Rereg.dbf** - The REREG.DBF file contains all the running exhaust emission-specific technology group distributions for the regional fleet. The file only contains the group fields and a frequency field.

Engine Start Emissions Module:

1. **Es-em.dbf** – The ES-EM.DBF file is Dbase 4 file of the engine start emission estimates. The file contains the SZID identifier linking the estimate to the SZ polygon database. The remaining fields show the hourly estimates of each pollutant in grams. The fields are listed as CO1-24, HC1-24, and NOx1-24.

Running Exhaust Emissions Module:

1. **Mr-em.dbf** - The MR-EM.DBF file is Dbase 4 file of the aggregate modal running exhaust emission estimates. The file contains the ARID identifier linking the estimate to the MR and ALLROADS line database. The remaining fields show the hourly estimates of each pollutant in grams. The fields are listed as CO1-24, HC1-24, and NOx1-24.
2. **Mz-em.dbf** – The MZ-EM.DBF file is Dbase 4 file of the minor road emission estimates. The file contains the MZID identifier linking the estimate to the MZ polygon database. The remaining fields show the hourly estimates of each pollutant in grams. The fields are listed as CO1-24, HC1-24, and NOx1-24.
3. **Scf-em.dbf -** The SCF-EM.DBF file is Dbase 4 file of the speed correction factor running exhaust emission estimates. The file contains the ARID identifier linking the estimate to the MR and ALLROADS line database. The remaining fields show the hourly estimates of each pollutant in grams. The fields are listed as CO1-24, HC1-24, and NOx1-24.

Gridded, Hourly, Emissions Module:

1. **Grid-em.dbf** – The GRID-EM.DBF file is a Dbase 4 file of the final gridded, hourly emissions. The file contains an identifier GDID that links to the GRID

polygon database. The remaining fields show the hourly estimates of each pollutant in grams. The fields are listed as CO1-24, HC1-24, and NOx1-24.

2. **Raster Files** – The raster datasets created in this module are used for display purposes and only re-represent data previously estimated. Each file represents a pollutant-mode-hour specific estimate. Therefore the following raster files are created:

SZCO1-24
SZHC1-24
SZNO1-24
MRCO1-24
MRHC1-24
MRNO1-24
MZCO1-24
MZHC1-24
MZNO1-24
SCFCO1-24
SCFHC1-24
SCFNO1-24
TOTALCO1-24
TOTALHC1-24
TOTALNO1-24